



## **Module Specification**

### **Industrial Internet of Things (IIoT)**

Version: 2024-25, v1.0, 15 Jun 2023

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## Part 1: Information

**Module title:** Industrial Internet of Things (IIoT)

**Module code:** UFMEW1-15-2

**Level:** Level 5

**For implementation from:** 2024-25

**UWE credit rating:** 15

**ECTS credit rating:** 7.5

**College:** College of Arts, Technology and Environment

**School:** CATE School of Engineering

**Partner institutions:** None

**Field:** Engineering, Design and Mathematics

**Module type:** Module

**Pre-requisites:** None

**Excluded combinations:** None

**Co-requisites:** None

**Continuing professional development:** No

**Professional, statutory or regulatory body requirements:** None

## Part 2: Description

**Overview:** The Industrial Internet of Things (IIoT) module is designed to provide students with an understanding of the principles and technologies behind the IIoT and its applications in the industrial sector. The module will cover key concepts such as connected devices, data analytics, machine learning, troubleshooting and digital twins, as well as emerging technologies such as 5G and edge computing.

Throughout the module, students will have the opportunity to work on real-world IIoT

projects and case studies, allowing them to apply their knowledge and skills in a practical setting. The module will also include guest lectures from industry experts and visits to industrial sites to give students a firsthand look at how the IIoT is being used in the real world.

**Features:** Not applicable

**Educational aims:** The educational aim of the Industrial Internet of Things (IIoT) module is to provide students with a comprehensive understanding of the principles and technologies behind the IIoT and its applications in the industrial sector.

**Outline syllabus:** I. Introduction to the Industrial Internet of Things

- Basics of the IIoT and its applications in the industrial sector
- Key components and technologies of the IIoT, including connected devices, data analytics, troubleshooting, digital twins, and edge computing.
- Ethical and privacy considerations in the use of the IIoT

II. Connected Devices in the Industrial Internet of Things

- Types of connected devices used in the IIoT
- Protocols and standards used to connect these devices
- Best practices for designing and deploying connected devices in the IIoT

III. Data Analytics in the Industrial Internet of Things

- Types of data generated by IIoT systems
- Techniques for collecting, storing, and analysing IIoT data
- Applications of data analytics in the IIoT, including predictive maintenance and process optimisation by using machine learning

IV. Cybersecurity in the Industrial Internet of Things

- Risks and vulnerabilities in IIoT systems
- Techniques for protecting IIoT systems from cyber threats
- Best practices for maintaining cybersecurity in the IIoT

V. Emerging Technologies in the Industrial Internet of Things

- Introduction to emerging technologies and edge computing
- Potential impact of these technologies on the IIoT

- Opportunities and challenges presented by these technologies

#### VI. Real-World Industrial Internet of Things Projects and Case Studies

- Working on real-world IIoT projects and case studies
- Applying the knowledge and skills learned in the module to solve problems and improve systems
- Communicating findings and insights effectively to both technical and non-technical audiences

#### VII. Guest Lectures and Industry Visits

- Guest lectures from industry experts on the latest trends and challenges in the IIoT
- Visits to industrial sites to see the IIoT in action.

### **Part 3: Teaching and learning methods**

**Teaching and learning methods:** The Industrial Internet of Things (IIoT) module will be taught through a combination of lectures, hands-on exercises, and real-world projects.

Lectures will provide students with a foundation of knowledge on the basics of the IIoT and its applications in the industrial sector, as well as the key components and technologies of the IIoT. These lectures will be supplemented with slides, demos, and other multimedia materials to help students better understand the material.

Hands-on exercises will give students the opportunity to apply what they have learned in a practical setting. These exercises may include working with sample data sets, building and testing IIoT systems, and analyzing the results.

Real-world projects will allow students to work on IIoT problems and projects that are relevant to the field of industrial IoT. These projects will provide students with the opportunity to apply their knowledge and skills in a practical setting, and to gain experience working on real-world problems.

In addition to lectures, hands-on exercises, and real-world projects, the module will also include guest lectures from industry experts and visits to industrial sites. These activities will provide students with the opportunity to learn from experienced professionals and see the IIoT in action in the real world.

**Module Learning outcomes:** On successful completion of this module students will achieve the following learning outcomes.

**MO1** Identify, understand, and critically analyse the basics, components, and technologies of the IIoT.

**MO2** Identify, justify, and apply industry-standard tools, methods, and protocols for IIoT.

**MO3** Evaluate the ethical and privacy considerations involved in, and the risks associated with IIoT.

**MO4** Evaluate and address the latest trends and challenges in IIoT, and communicate the findings effectively to both technical and non-technical audiences.

**Hours to be allocated:** 150

**Contact hours:**

Independent study/self-guided study = 114 hours

Face-to-face learning = 36 hours

Total = 150

**Reading list:** The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://readinglists.uwe.ac.uk) via the following link

<https://rl.talis.com/3/uwe/items/6d16db63-ed66-4fab-9e9e-2f8c20dc49eb.html?lang=en&login=1>

## **Part 4: Assessment**

**Assessment strategy:** Assessment of this module (for both sit and resit) consists of the following:

Practical Skills Assessment:

This is a software and/or hardware skills assessment of the design and/or development of Industrial Internet of Things Applications.

Written Assignment:

Group submission of a portfolio that consists of a report and project management documentation.

**Assessment tasks:**

**Practical Skills Assessment (First Sit)**

Description: This is a software and/or hardware skills assessment of the design and/or development of Industrial Internet of Things Applications.

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO4

**Written Assignment (First Sit)**

Description: Group submission of a portfolio that consists of a report and project management documentation

Weighting: 75 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO2, MO3, MO4

**Practical Skills Assessment (Resit)**

Description: This is a software and/or hardware skills assessment of the design and/or development of Industrial Internet of Things Applications.

Weighting: 25 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO2, MO4

**Written Assignment (Resit)**

Description: Group submission of a portfolio that consists of a report and project management documentation

Weighting: 75 %

Final assessment: Yes

Group work: Yes

Learning outcomes tested: MO2, MO3, MO4

## **Part 5: Contributes towards**

This module contributes towards the following programmes of study:

Mechatronics Engineering [Frenchay] MEng 2023-24

Mechatronics Engineering [Frenchay] BEng (Hons) 2023-24